A MODEL OF ENGAGING GAMIFICATION MECHANICS FOR ACHIEVING MOOC LEARNING OUTCOMES AMONG TVET LEARNERS

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MASTER OF SCIENCE IN INFORMATION AND COMMUNICATION TECHNOLOGY

2020

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A thesis submitted
in fulfillment of the requirements for the degree of
Master of Science in Information and Communication Technology

Faculty of Information and Communication Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2020

DECLARATION

I declare that this thesis entitled “A Model of Engaging Gamification Mechanics for Achieving MOOC Learning Outcomes Among TVET Learners” is the result of my own research except as cited in the references. The thesis has not been for any degree and is not concurrently submitted in candidature of any other degree.

Signature : ……

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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award on Master of Science in Information and Communication Technology.

Signature : ……..……..

Supervisor Name : Professor Ts. Dr. Sazilah binti Salam

Date : ……

DEDICATION

This thesis is specially dedicated to:

My beloved parents, Mohd Yusoff bin Mohd Shariff and Salmeh binti Ithnin; my wife Monaliza binti Othman and all my children; Muhammad Harith Danial, Nur Harisah Dinie, Nur Hannah Damia, Muhammad Hannan Danish and Muhammad Harraz Dayyan

ABSTRACT

Gamification is the integration of game-like design elements into non-game context to engage learners. In tertiary education, researchers and practitioners have been seeking for effective ways to improve student engagement and promote learning. A number of study analyses examining the relationship between MOOC and learning engagement indicated that 25% of learner did not do activities and only 11.7% learner exceed learning goal. This study is conducted to introduce a model of engaging online learning using gamification mechanic (EG-MOOC) in achieving MOOC TVET learning outcomes. There are three objectives to be achieved in this study. The first objective is to determine what are the best appropriate gamification elements for TVET learners, the second objective is to propose a model of engaging online learning using gamification mechanics in achieving MOOC learning outcomes among TVET learners and the third objective is to validate the proposed engaging gamification massive open online courses model. This study applied quantitative methods. In analysis and design phase, the elements of EG-MOOC model were identified through data analysis from Analytical Hierarchy Process Analysis (AHP), documents review and finally validated by five experts. A prototype of EG-MOOC that integrates six gamification elements which are Virtual Goods, Wally's Game, Trophies-Badged, Rewards, Skill Points and Peer Grading to measure learner's engagement was implemented in Multimedia Systems subject through Open Learning platform. A total of 138 undergraduates from Bachelor of Computer Science (Interactive Media) in a *Universiti Teknikal Malaysia Melaka* (UTeM) had participated in a quasi-experiment. A pre-test-post-test design with control and experiment group was set up to examine the effects of gamification mechanics. There were three testing instruments used in this research, namely pre-test and post-test, administrative data from system and online survey of learner perception in gamification system. The research model is tested via Partial Least Squares Structured Equation Model. The findings show that overall model explaining 69.7% variance in learning engagement. Besides that, the result revealed that Badge for Behaviour had strong relationship in a direct effect towards learners learning engagement. Non-parametric test which is Wilcoxon Signal-Ranked Test was run to assess the student performance. Pre-test and post-test findings show that there is a positive effect on student performance. In conclusion, EG-MOOC model has a positive impact in improving learners' engagement and encourage learners to achieve learning outcomes. Conceptual design of EG-MOOC system can be used as a guideline and model in the produce of gamification-oriented learning model and framework for other student groups.

ABSTRAK

Gamifikasi adalah penyepaduan elemen reka bentuk seperti permainan ke dalam konteks bukan permainan untuk melibatkan pelajar. Dalam pendidikan tinggi, para penyelidik dan pengamal telah mencari cara yang berkesan untuk meningkatkan penglibatan pelajar dan mempromosikan pembelajaran. Sejumlah analisis kajian telah mengkaji hubungan antara MOOC *dan pembelajaran yang melibatkan 25% pelajar tidak melakukan aktiviti dan hanya 11.7% pelajar melebihi matlamat pembelajaran. Kajian ini dijalankan untuk memperkenalkan model pembelajaran dalam talian dengan menggunakan mekanik permainan* (EG-MOOC) *dalam mencapai hasil pembelajaran* MOOC. *Terdapat tiga matlamat yang perlu dicapai dalam kajian ini. Objektif pertama adalah untuk menentukan unsur gamifikasi yang sesuai untuk pelajar* TVET, *yang kedua mencadangkan model pembelajaran dalam talian dengan menggunakan gamifikasi mekanik dalam mencapai hasil pembelajaran* MOOC *dan objektif ketiga untuk mengesahkan cadangan model latihan dalam talian terbuka secara besar-besaran. Kajian ini menggunakan kaedah kuantitatif. Dalam analisis dan fasa reka bentuk, elemen-elemen model EG-MOOC telah dikenal pasti melalui analisis data daripada Analisis Proses Hierarki* (AHP), *kajian dokumen dan akhirnya disahkan oleh lima pakar. Satu prototaip* EG-MOOC *yang mengintegrasikan enam unsur gamifikasi yang merupakan Barang Maya* (Virtual Goods), *Permainan Wally* (Wally's Game), *Piala-Lencana* (Trophies-Badged), *Ganjaran* (Rewards), *Mata Kemahiran* (Skill Points) *and Penggredan Rakan* (Peer Grading) *untuk mengukur keterlibatan pelajar dilaksanakan di dalam matapelajaran Multimedia Sistem melalui platform* Open Learning. *Seramai 138 orang mahasiswa dari Sarjana Muda Sains Komputer (Media Interaktif) di Universiti Teknikal Malaysia Melaka* (UTeM) *telah mengambil bahagian dalam kajian kaedah kuasi. Reka bentuk pra-ujian selepas ujian dengan kawalan dan kumpulan eksperimen adalah persediaan untuk mengkaji kesan mekanik gamifikasi. Terdapat tiga instrumen ujian yang digunakan iaitu pra ujian dan ujian pasca, data pentadbiran dari sistem dan kajian dalam talian persepsi pelajar dalam sistem gamifikasi. Model penyelidikan diuji melalui Model Persamaan Tersusun Separa Separa. Penemuan menunjukkan bahawa keseluruhan model menerangkan perbezaan 69.7% dalam pengajaran dan pembelajaran. Di samping itu, keputusan menunjukkan bahawa Lencana untuk Tingkah Laku mempunyai hubungan yang kuat dengan kesan langsung ke arah pembelajaran pelajar. Ujian bukan parametrik yang merupakan* Wilcoxon Signal-Ranking Test *telah dijalankan untuk menilai prestasi pelajar. Ujian pra-ujian dan ujian pasca menunjukkan bahawa terdapat kesan positif terhadap prestasi pelajar. Kesimpulannya, model* EG-MOOC *mempunyai kesan positif dalam meningkatkan keterlibatan pelajar dan menggalakkan pelajar mencapai hasil pembelajaran. Reka bentuk konsep sistem* EG-MOOC *boleh digunakan sebagai garis panduan dan model dalam menghasilkan model dan kerangka pembelajaran berorientasi gamifikasi untuk kumpulan pelajar yang lain.*

ACKNOWLEDGEMENTS

Alhamdulillah. Praise be to Allah (SWT) the Almighty for the successful completion of this thesis as through His Grace and the prayers of my loved ones, this challenging journey in the pursuit of my master study has finally reached its destination. I could have never done this alone without the support of loving people around me.

I would like to take this opportunity to express my sincere appreciation to my supervisor Professor Ts. Dr. Sazilah binti Salam for her essential supervision, advice, and support throughout my study. I would also like to thank to my co-supervisor Dr. Siti Nurul Mahfuzah binti Mohamad for her encouragement and guidance towards the completion of this thesis. On top of that, my deepest gratitude to the certificate students from FTMK UTeM who had participated in this project as well as the lecturers for their cooperation, time spent and effort during experiment phase.

My appreciation is also dedicated to Dr. Noor Azean binti Atan (UTM), Prof. Madya Dr. Noraida binti Hj Ali (UMT), Prof. Madya Dr. Anealka binti Aziz Hussin (UiTM), Dr. Ibrahim bin Ahmad (UTeM), Dr. Hamzah Asyrani bin Sulaiman (UTeM), Dr. Nurkhamimi bin Zainuddin (USIM) and Dr. Zool Hilmi bin Mohamed Ashari (MPSW Lecturer-SEM PLS Subject) for all advice and suggestions during design process. Special thanks to Dr. Ahmad Rosli bin Mohd Nor (KKMT) and Dr. Sharifah Nadiyah binti Razali (KKSL) for their guidance in the process of developing survey instruments. Finally, my deepest appreciation is dedicated to all my family members who have helped me during this long journey.

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LIST OF ABBREVIATIONS

ADDIE	-	Analyze, Design, Develop, Implement, Evaluate
AHP	-	Analytical Hierarchy Process Analysis
DV	-	Dependent variable
EG-MOOC	-	Engaging Gamification Massive Open Online Courses
GM	-	Gamification Mechanic
HTMT	-	Hererotrail–Monotrail Ratio of Correlations
IV	-	Independent variable
L – C	-	Learner – Content
L – I	-	Learner – Instructor
L – L	-	Learner – Learner
MOOC	-	Massive Open Online Courses
MV	-	Moderating variable
PLS - SEM	-	Partial Least Squares Structured Equation Model
TVET	-	Technical and Vocational Education and Training

LIST OF PUBLICATIONS

Yusoff, A.M., Salam, S., Mohamad, S.N.M., and Daud, R., 2018. TOPIC: Engaging Gamification Mechanic Design for TVET Open Learning Platform (EG-MOOC). University Carnival On E-Learning (IUCEL) 2018, pp. 548–552.

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